UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/675,478	09/30/2003	Amit G. Bagchi	BP2619	6001

51472 7590 07/07/2009

GARLICK HARRISON & MARKISON
P.O. BOX 160727
AUSTIN, TX 78716-0727

EXAMINER	
CASCA, FRED A	
ART UNIT	PAPER NUMBER
2617	
MAIL DATE	DELIVERY MODE
07/07/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/675,478	BAGCHI ET AL.	
	Examiner	Art Unit	
	FRED A. CASCA	2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 April 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13,23-38 and 64-80* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-13,28-38 and 64-80* is/are allowed.

6)☒ Claim(s) *23-26* is/are rejected.

7)☒ Claim(s) *27* is/are objected to.

8)☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed April 14, 2009 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shpak (US 2004/0162037 A1) in view of Ketchum et al (US 2003/0235255 A1).

Referring to claim 23, Shpak discloses a classification method (abstract and figure 1), the method comprising:

receiving a frame of data (figs. 1-3 and paragraphs 8 and 16, "WLAN", note that WLAN receivers receive frame of data as in any digital communication system);

pre-processing (Fig. 2-3 and paragraphs 18-19 and 48, "The triplexers similarly divide the uplink signals by frequency channels") the received frame within each PHY receiver of a plurality of PHY receivers to calculate a corresponding confidence level for each PHY receiver of the plurality of PHY receives such that each corresponding confidence level indicates whether the received frame is intended for that PHY receiver of the plurality of PHY receivers (Fig. 2-3 and paragraphs 18-19 and 48, "so that the frequency channel of F1 is passed to PHY 33, F2 to PHY 34 … ," "The triplexers shown here, for use in the 2.4 GHz band of IEEE 802.11b/g, are just one example of RF multiplexes that may be used in sharing antennas among multiple WLAN channels … six- or eight-way multiplexer could be used", note that one of the transceivers (PHY receiver) from a plurality of transceiver is selected (classified) according to its level confidence (capabilities)),

classifying the received frame as being intended for a PHY receiver of a plurality of PHY receivers based on the corresponding confidence levels (Fig. 2-3 and Par. 47-48);

based on the classification, selecting one PHY receiver of the plurality of PHY receivers as being an intended PHY receiver (Fig. 2-3 and Par. 47-48); and

processing the received frame using the intended PHY receiver (Fig. 3, and Par. 47 lines 4-7).

Shpak does not specifically disclose wherein the pre-processing the received frame includes using a first gain to scale the received frame to a range that is appropriate for a majority of the PHY receivers and the processing the received frame using the intended PHY receiver includes using a

second gain to scale the received frame to a range that is appropriate for the intended PHY receiver.

Ketchum discloses a MIMO-OFDM communication system that uses singular value decomposition (SVD) where a channel **H** is decomposed into a unitary matrix **U**, a diagonal matrix Λ, and another unitary matrix $\mathbf{V}^H$. In MIMO the $\mathbf{V}^H$ is used at the transmitter for pre-processing of the input signals and the **U** is used at the receiver for processing of the received signal (see Par. 4 and 54-59). Therefore, Ketchum's **U** matrix refers to the first gain and the Ketchum's $\mathbf{V}^H$ refers to the second gain.

It would have been obvious to a person of ordinary skill in the art at the time of invention to modify the method of Shpak by incorporating the teachings of Ketchum and consequently decomposing the channel gain **H** of Shpak into its unitary and diagonal components by using well-known SVD concepts, and allow the preprocessing be performed on a first channel gain (**V** matrix) and processing to be performed on a second channel gain (**U** matrix) as described in SVD technique, for the purpose of providing an efficient communication system.

Referring to claim 24, the combination of Shpak/Ketchum discloses the method of claim 23, wherein the classifying of the received frame further comprises: computing a correlation using the received frame and a predetermined spreading sequence of a DSSS/CCK (Direct Sequence Spread Spectrum/Complementary Code Keying) frame (Shpak, pars: 2 and 39, and Ketchum, Par. 4 and 54-59, note that "Bluetooth" uses DSSS/CCK. Further note that there is a correlation between the Ketchum's channel matrix **H** and its decomposed parts).

Referring to claim 25, the combination of Shpak/Ketchum discloses the method of claim 23, wherein the classifying of the received frame further comprises:

computing a correlation using the received frame and a delayed copy of the received frame wherein the delay between the received frame and the delayed copy of the received frame is a period of a training sequence of the received frame Shpak, pars: 2 and 39, and Ketchum, Par. 4 and 54-59, note that in MIMO OFDM multipath delays are detected and used of for obtaining a better quality channel).

Referring to claim 26, the combination of Shpak/Ketchum discloses the method of claim 23, wherein one PHY receiver of the plurality of PHY receivers is an IEEE 802.11b operable PHY receiver; and one PHY receiver of the plurality of PHY receivers is an IEEE 802.11g operable PHY receiver (Shpak, pars: 2 and 39, and Ketchum, Par. 4 and 54-59, note that "Bluetooth").

It would have been obvious to a person of ordinary skill in the art at the time of invention to modify the combination in the format claimed by incorporating the IEEE802.11b receivers of Shpak and OFDM receives of Ketchum, for the purpose of providing an efficient communication system.

Allowable Subject Matter

4. Claim 27 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 1-13, 28-38 and 64-80 are allowed.

Response to Arguments

5. Applicant's arguments with respect to claims 23-26 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fred A. Casca whose telephone number is (571) 272-7918. The examiner can normally be reached on Monday through Friday from 9 to 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Harper, can be reached at (571) 272-7605. The fax number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/VINCENT P. HARPER/
Supervisory Patent Examiner, Art Unit 2617